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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/718,008	11/21/2000	Kenneth Perlin	KPER-4	9323

7590 01/29/2003

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EXAMINER

WANG, JIN CHENG

ART UNIT	PAPER NUMBER
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2672

DATE MAILED: 01/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/718,008

Applicant(s)

PERLIN, KENNETH

Examiner

Jin-Cheng Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other:

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DETAILED ACTION

Notice of Change in Art Unit

1. The Group and/or Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 2672.

Objection

2. Under certain circumstances an application for patent is entitled to the benefit of the filing date of a prior nonprovisional application or provisional application which has at least one common inventor. The conditions are specified in 35 U.S.C. 120 and 35 U.S.C. 119(e).

3. One requirement of these statutes is that the current application contains a specific reference to the first application. This reference must be the first sentence of the specification following the title, and it should preferably be specified as a separate paragraph (see MPEP 201.11, 37 CFR 1.78(a)).

4. Therefore, until the specification is updated accordingly, applicants do not have the benefit of the earlier filing date of the provisional application.

Drawings

5. The drawings in this application are objected to by the Draftsperson as informal. Any drawing corrections requested, but not made in the prior application should be repeated in this application if such changes are still desired. If the drawings were changed and approved during the prosecution of the prior application, a petition may be filed under 37 CFR 1.182 requesting

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the transfer of such drawings, provided the parent application has been abandoned. However, a copy of the drawings as originally filed must be included in the 37 CFR 1.60 application papers to indicate the original content.

The Patent and Trademark Office no longer makes drawing changes. See 1017 O.G. 4. It is applicant's responsibility to ensure that the drawings are corrected. Corrections must be made in accordance with the instructions below.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

6. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability."

Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

7. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.185(a). Failure to take corrective action within the set (or extended) period will result in **ABANDONMENT** of the application.

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Specification

8. The disclosure is objected to because of the following informalities: On page 3, line 17, "choose" should be "chosen". On page 16, line 7, "lattic" should be "lattice". On page 34, line 4 of claim 6, "performing and a inner product" should be "performing an inner product". On page 35, lines 4 of claim 11, "various" should be "values". Appropriate correction of all mistakes is required.
9. The applicant or their representatives are urged to review the specification and submit corrections for all mistakes of a grammatical, clerical, or typographical nature.

Claim Objections

10. Claims 6 and 11 are objected to because of the following informalities: On line 4 of claim 6, "performing and a inner product" should be "performing an inner product". On page 35, lines 4 of claim 11, "various" should be "values". Appropriate correction of all mistakes is required.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

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(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

12. Claims 1 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Andy G. Ye and David M. Lewis "Procedural Texture Mapping on FPGAs", ACM 1999, 1-58113-088-0/99/02, page 112-120.

13. Claim 1:

The Ye reference teaches a method for creating an appearance of texture in a computer image (see e.g., figures 11-14) comprising the steps of:

Inputting a point $\{x_d\}$ in D-dimensional geometric space RD described via D M bit quantities i_d and D N bit quantities u_d , where i_d are M bit representations of greatest integers not $> x_d$, and u_d are N bit representations of remainders $(x_d - i_d)$, where M and N are integers > 3 , in a computer (page 116);

Computing a pseudo-random hash value at each vertex of a unit cube C surrounding the point (figure 8);

Computing a contribution from each vertex using the hash-value (figure 6);

Combining with the computer the contribution from each vertex into a single interpolated result (page 115-116).

14. Claim 12:

The Ye reference teaches an apparatus for creating an appearance of texture in a computer image (pages 117-118) comprising:

A computer (pages 117-118);

A mechanism for inputting a point $\{xd\}$ in D-dimensional geometric space RD described via D M bit quantities id and D N bit quantities ud , where id are M bit representations of greatest integers not $> xd$, and ud are N bit representations of remainders $(xd - id)$, where M and N are integers > 3 , in a computer (page 116);

A mechanism for computing a pseudo-random hash value at each vertex of a unit cube C surrounding the point (figure 8);

A mechanism for computing a contribution from each vertex using the hash-value (figure 6);

A mechanism for combining with the computer the contribution from each vertex into a single interpolated result (page 115-116).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 2-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andy G. Ye and David M. Lewis "Procedural Texture Mapping on FPGAs", ACM 1999, 1-58113-088-0/99/02, page 112-120.

17. Claims 2-4:

(1) The Ye reference teaches a method of hardware texture mapping in which texture images are synthesized using FPGAs including the computing a hash value step (page 116), the computing a contribution step and the combining step.

(a) The Ye reference teaches computing multiple n-bit pseudo-random hash values, one hash value for each of the eight vertices of the surrounding unit cube C using XOR table.

(b) The Ye reference teaches computing for each vertex of the surrounding unit cube C the contribution of each vertex with XOR modules.

(c) The Ye reference teaches combining the contribution from each vertex into a single result using 3 ease-curve s modules (figures 6, 9 and 10).

(2) The Ye reference does not teach (a) six “+” modules combined with seven “L” modules; (b) three “+” modules combined with eight “H” modules; (c) the s modules.

(3) The Ye reference however teaches (a) the “+” modules (figure 8); (b) the “L” modules and the “H” modules (figures 7 and 8); (c) the s modules (figures 6 and 10).

(4) It would have been obvious to one of ordinary skill in the art to have incorporated the various combinations of “+” modules, the “L” modules, “H” modules and the s modules into the Ye’s method for hardware texture mapping because Ye suggests implementing “+” modules in figure 8, XOR modules in figure 8 and s modules in figures 6 and 10 and therefore suggesting an obvious modification.

(5) Therefore, it would have been obvious to implement Ye’s method with some specific numbers/combinations of modules in different layout so that it would facilitate an efficient implementation of Perlin Noise based 3-D procedural textures.

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Claim 5:

The claim 5 encompasses the same scope of invention as that of claim 4 except additional claimed limitation of a look-up table. However, the Ye reference further discloses the claimed limitation of a look-up table (page 116).

Claim 6:

The claim 6 encompasses the same scope of invention as that of claim 5 except additional claimed limitation of computing a gradient direction from each hash value. However, the Ye reference further discloses the claimed limitation of computing a gradient direction from each hash value (page 116).

Claim 7:

The claim 7 encompasses the same scope of invention as that of claim 6 except additional claimed limitation of allowing the inner product to be done using no multiples, only adds and shifts. However, the Ye reference further discloses the claimed limitation of allowing the inner product to be done using no multiples, only adds and shifts (figures 6-10).

Claim 8:

The claim 8 encompasses the same scope of invention as that of claim 7 except additional claimed limitation of choosing the gradients. However, the Ye reference further discloses the claimed limitation of choosing the gradients (page 116).

Claim 9:

The claim 9 encompasses the same scope of invention as that of claim 8 except additional claimed limitation of using 7 linear-interrelation modules L to perform a trilinear interpolation.

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However, the Ye reference further discloses the claimed limitation of using 7 linear-interrelation modules L to perform a trilinear interpolation (pages 115-116).

Claim 10:

The claim 10 encompasses the same scope of invention as that of claim 9 except additional claimed limitation of computing an ease curve. However, the Ye reference further discloses the claimed limitation of computing an ease curve (page 116).

Claim 11:

The claim 11 encompasses the same scope of invention as that of claim 10 except additional claimed limitation of linear interpolations modules. However, the Ye reference further discloses the claimed limitation of linear interpolations modules (figure 7).

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hashimoto U.S. Pat. No. 5,889,526 discloses an interpolation apparatus.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (703) 605-1213. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-6606 for regular communications and (703) 308-6606 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 395-3900.

jcw
January 23, 2003

A handwritten signature in black ink, appearing to read 'M. Razavi', with a long horizontal line extending to the right.

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600